

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
23 October 2003 (23.10.2003)

PCT

(10) International Publication Number
WO 2003/087397 A3

(51) International Patent Classification⁷: C12Q 1/02, 1/68

(21) International Application Number:

PCT/NL2003/000264

(22) International Filing Date: 8 April 2003 (08.04.2003)

(25) Filing Language: Dutch

(26) Publication Language: English

(30) Priority Data:

1020415 17 April 2002 (17.04.2002) NL

(71) Applicant (for all designated States except US): NED-
ERLANDSE ORGANISATIE VOOR TOEGEPAST-
NATUURWETENSCHAPPELIJK ONDERZOEK
TNO [NL/NL]; Schoemakerstraat 97, NL-2628 VK Delft
(NL).

(72) Inventors; and

(75) Inventors/Applicants (for US only): MONTIJN, Roy,
Christiaan [NL/NL]; Werengouw 9, NL-1024 NL Am-
sterdam (NL). SCHUREN, Frank, Henri, Johan [NL/NL];
Bachlaan 34, NL-3906 ZK Veenendaal (NL).

(74) Agent: PRINS, A.W.; Nieuwe Parklaan 97, NL-2587 BN
Den Haag (NL).

(81) Designated States (*national*): AE, AG, AL, AM, AT (util-
ity model), AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA,
CH, CN, CO, CR, CU, CZ (utility model), CZ, DE (util-
ity model), DE, DK (utility model), DK, DM, DZ, EC, EE
(utility model), EE, ES, FI (utility model), FI, GB, GD, GE,
GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ,
LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN,
MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU,
SC, SD, SE, SG, SK (utility model), SK, SL, TJ, TM, TN,
TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM,
KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW),
Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE,
ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO,
SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

(88) Date of publication of the international search report:
8 January 2004

*For two-letter codes and other abbreviations, refer to the "Guid-
ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.*

(54) Title: PROCESS CONTROL BASED ON MICROBIOLOGICAL ACTIVITY

(57) Abstract: The present invention relates to the determination of environmental conditions for the purpose of process control using microorganisms. The present invention uses the principle that intrinsic changes in a microorganism after applying an external stimulus are characteristic of the nature of the stimulus the microorganism receives from outside. By measuring these intrinsic changes, microorganisms can be used as a specific sensor to determine environmental conditions, to determine the degree of change in these environmental conditions, to determine the nature and force of the stimulus and to be able to measure the effects of a diversity of stimuli on various processes and thus control these processes.

WO 2003/087397 A3

INTERNATIONAL SEARCH REPORT

Int 1st Application No
PCT/NL 03/00264

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C12Q1/02 C12Q1/68

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 C12Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	HUGHES TIMOTHY R ET AL: "Functional discovery via a compendium of expression profiles." CELL, vol. 102, no. 1, 7 July 2000 (2000-07-07), pages 109-126, XP002226924 ISSN: 0092-8674 the whole document --- -/--	1,2,4-7, 11

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- "G" document member of the same patent family

Date of the actual completion of the international search

24 October 2003

Date of mailing of the international search report

17/11/2003

Name and mailing address of the ISA
European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Lejeune, R

INTERNATIONAL SEARCH REPORT

Int. Application No
PCT/NL 03/00264

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	TAURIAINEN S M ET AL: "Detecting bioavailable toxic metals and metalloids from natural water samples using luminescent sensor bacteria" WATER RESEARCH, ELSEVIER SCIENCE PUBLISHERS, AMSTERDAM, NL, vol. 34, no. 10, July 2000 (2000-07), pages 2661-2666, XP004203363 ISSN: 0043-1354 cited in the application the whole document	1-4,8-11
X	BELKIN S ET AL: "A panel of stress-responsive luminous bacteria for the detection of selected classes of toxicants" WATER RESEARCH, ELSEVIER SCIENCE PUBLISHERS, AMSTERDAM, NL, vol. 31, no. 12, 1 December 1997 (1997-12-01), pages 3009-3016, XP004098418 ISSN: 0043-1354 cited in the application abstract	1-4,8-11
X	WO 99 09202 A (MANGIAROTTI GIORGIO ;MANGIAROTTI VALENTINA (IT)) 25 February 1999 (1999-02-25) cited in the application the whole document	1-4,8-11
X	EP 0 665 292 A (ENIRICERCHE SPA) 2 August 1995 (1995-08-02) claim 1	1-4,8-11
A	GASCH AUDREY P ET AL: "Genomic expression programs in the response of yeast cells to environmental changes" MOLECULAR BIOLOGY OF THE CELL, vol. 11, no. 12, December 2000 (2000-12), pages 4241-4257, XP002259051 ISSN: 1059-1524 abstract page 4244, right-hand column, paragraph 3	1-11
A	VAN DER WERF M J ET AL: "Nutrigenomics: Application of genomics technologies in nutritional sciences and food technology" JOURNAL OF FOOD SCIENCE, vol. 66, no. 6, August 2001 (2001-08), pages 772-780, XP002258928 ISSN: 0022-1147 the whole document	1-11

-/--

INTERNATIONAL SEARCH REPORT

International Application No
PCT/NL 03/00264

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
T	NAKASONA S ET AL: "EFFECT OF POWER-FREQUENCY MAGNETIC FIELDS ON GENOME-SCALE GENE EXPRESSION IN SACCHAROMYCES CEREVISIAE" RADIATION RESEARCH, ACADEMIC PRESS INC, US, vol. 160, no. 1, July 2003 (2003-07), pages 25-37, XP009018565 ISSN: 0033-7587 the whole document -----	1-11

INTERNATIONAL SEARCH REPORT

In
national Application No
PCT/NL 03/00264

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9909202	A	25-02-1999	IT T0970751 A1	22-02-1999
			AU 9259298 A	08-03-1999
			WO 9909202 A1	25-02-1999
			EP 1005568 A1	07-06-2000
EP 0665292	A	02-08-1995	IT 1269200 B	21-03-1997
			AT 190668 T	15-04-2000
			DE 69515534 D1	20-04-2000
			DE 69515534 T2	03-08-2000
			DK 665292 T3	03-07-2000
			EP 0665292 A1	02-08-1995
			ES 2142996 T3	01-05-2000
			GR 3033130 T3	31-08-2000
			PT 665292 T	30-06-2000
			US 5674702 A	07-10-1997